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EDITORIAL

Imaging in staging of malignant pleural mesothelioma

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Malignant pleural mesothelioma (MPM) is an uncommon neoplasm arising from mesothelial cells of the pleura and less commonly of the pericardium or peritoneum. The annual incidence of 3000 cases is expected to increase by more than 50% in the coming decade due to the patterns of occupational exposure to asbestos and latency period of 30–40 years[1,2]. Treatment options depend on stage at presentation with an increasing tendency to perform surgical resection in limited disease. Primarily in an attempt to distinguish those patients who are potentially resectable and stratify patients into categories with similar prognosis, the new international staging system for MPM describes the anatomic extent of disease in a traditional TNM (tumor, node, metastasis) system. Because accurate anatomic staging is becoming important in determining the selection of patients for potentially curative resection, imaging evaluation is an essential component in the appropriate management of these patients.

Computerised tomography (CT) is the primary imaging modality for staging of MPM. Since determination of mediastinal nodal disease by both CT and magnetic resonance imaging (MRI) is not optimal, mediastinoscopy is typically performed for patients with questionable nodal status considered for pneumonectomy. MRI is superior to CT in delineating transdiaphragmatic extension and chest wall invasion. A potentially valuable tool in the preoperative assessment of patients with MPM is positron emission tomography (PET). PET imaging of malignancies is typically performed with the radiopharmaceutical F18-fluoro-2-deoxy-D-glucose (FDG), a D-glucose analog. Increased glucose metabolism by malignant cells results in increased uptake and accumulation of FDG, allowing diagnosis, staging and assessment of treatment response. However, false positives can occur in infection and inflammation. A small study comparing FDG–PET imaging to CT evaluation was performed in 18 patients with MPM[3]. All MPM accumulated 18F-FDG and 18F-FDG–PET detected occult metastases in two patients being considered for surgical resection. A second small study comparing FDG–PET imaging to CT evaluation was performed in patients suspected of having MPM [4]. FDG uptake was significantly higher in MPM when compared to benign pleural diseases (sensitivity, 91%; specificity, 100%) and showed improved detection of malignancy in mediastinal nodal disease when compared to CT. Additionally, as FDG–PET provides information on metabolically active sites of disease, this modality may be used in conjunction with anatomic imaging to select the most appropriate area for biopsy[5].

In our experience integrated PET/CT (the integration of functional PET data with anatomic CT data) has improved diagnostic accuracy in the staging of patients with MPM. Integrated PET/CT allows more precise anatomic localisation of disease and is useful in detecting nodal and systemic metastatic disease. This is not unexpected considering the published data supporting the improvement in diagnostic accuracy of integrated PET/CT in the staging of non-small-cell lung cancer (NSCLC)[6,7]. Staging was correctly determined in more NSCLC patients with PET/CT than with either PET alone or CT alone[6]. In summary, although the role of FDG–PET has not been fully elucidated, in our

experience integrated PET/CT by improving evaluation of locoregional disease and detection of metastatic disease is a potentially valuable new tool in the preoperative assessment of patients with MPM.

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